MANAGEMENT UNIT 17 - WASATCH MOUNTAINS

BOUNDARY DESCRIPTION

Salt Lake, Summit, Wasatch, Duchesne, Carbon, and Utah Counties - Boundary begins at the junction of I-15 and I-80 in Salt Lake City; east on I-80 to US-40; south on US-40 to SR-32; east on SR-32 to SR-35; southeast on SR-35 to SR-87; south on SR-87 to Duchesne and US-191; south on US-191 to US-6; northeast on US-6 to I-15; north on I-15 to I-80 in Salt Lake City and beginning point.

MANAGEMENT UNIT DESCRIPTION

Management unit 17 is divided into eight smaller, more manageable subunits. These are: Diamond Fork, Hobble Creek, Timpanogos, Salt Lake County-East Bench, Heber, Currant Creek, Avintaquin, and Price Canyon. The 2007 report covers only the Diamond Fork, Hobble Creek, Timpanogos, and Heber subunits. The Salt Lake County-East Bench subunit no longer contains range trend studies due to lack of access and development. The Currant Creek and Avintaquin subunits are monitored as part of the Division's Northeastern Region rotation which were last read in 2005 and will be reread in 2010. The Price Canyon subunit is monitored as part of the Division's Southeastern Region rotation which was last read in 2004 and will be reread in 2009.

Of the total area within this management unit, 63% is summer range, 35% is winter range, and 2% is classified as year-long range. The areas of most concern in this unit are the winter ranges, which are very limited in quantity and quality. Residential developments along the Wasatch Front have consumed much of the critical winter range that was available to wildlife, and this will continue in the future. Because most of the winter range in this unit now lies on private land, managing wildlife populations is a challenge. Critical issues facing management of big game in unit 17 include crop depredation, habitat quantity and quality, and highway mortality (Hersey and McLaughlin 2006).

Habitat Management Objectives/Strategies

The primary habitat management objectives for this unit are: 1) maintain and/or enhance forage production through direct range improvements throughout the unit on winter range; 2) work with private landowners and federal, state, local, and tribal governments to maintain and protect critical and existing winter range from future losses; and 3) provide improved habitat security and escapement opportunities for deer. The strategies to be used to accomplish these objectives are: 1) monitor range trend studies throughout the unit, specifically those found on remaining winter ranges; 2) work cooperatively to utilize grazing, prescribed burning, and other recognized vegetative manipulation techniques to enhance deer forage quantity and quality; 3) utilize antlerless deer harvest to improve or protect forage when vegetative declines are attributed to deer over-utilization; and 4) cooperate with and provide input to land management planning efforts dealing with management affecting habitat security, quality, and quantity (Hersey and McLaughlin 2006).

Range Trend Studies

The range trend studies in the Diamond Fork, Hobble Creek, and Timpanogos subunits were established in 1983, and resampled in 1989, 1997, 2002, and 2007. The trend studies in the Heber subunit were established in 1983 and 1984, and resampled in 1989, 1996, 2002, and 2007. Several studies were suspended in 2002 due to lack of access and loss to development. Some studies were not read because they no longer are representative of critical winter range. Several new studies were established in 2002 to monitor new areas considered critical for big game, including a few for Rocky Mountain bighorn sheep. In 2007, two studies were suspended due to lack of access. The suspension of old studies and the establishment of new sites is done with input from Division biologists and federal land managers.

SUMMARY

WILDLIFE MANAGEMENT UNIT 17 - WASATCH MOUNTAINS

The Wasatch Mountain unit is large and covers a vast area. The western half of Unit 17 was sampled in 2007. Studies on the Unit are concentrated in three different areas which include the Heber Valley, the Wasatch Front, and Spanish Fork Canyon. The majority of the trend studies were established in 1983 and reread in 1989. The Heber Valley area was reread in 1996 and the rest of the Unit was reread in 1997 and 2002. In 2007, 29 trend studies were reread. No new studies were added, but two studies were suspended: Hobble Creek Bench (17-63) and Hailstone (17-69). Both were suspended because of access problems.

Community Types

Studies have been established on a variety of community types. There are 16 studies that are dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and one that is dominated by basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). There are four mountain brush studies, three Stansbury cliffrose (*Cowania mexicana* ssp. *stansburiana*) studies, and one Rocky Mountain smooth sumac (*Rhus glabra* ssp. *cismontana*) study. One study is dominated by Gambel oak (*Quercus gambelii*), and two others have a mix of sagebrush and oak. Lastly, there is one study that was chained and seeded which is dominated by perennial grasses.

Precipitation

Both annual and seasonal precipitation play important roles in vegetation trends. Data from four weather stations within the boundaries of Unit 17 were summarized for precipitation patterns over the past two decades. These stations are located at Heber, Deer Creek Dam, Pleasant Grove, and Provo (BYU). The combined average annual precipitation during that time from all four stations is 18.7 inches (47.4 cm). Drought conditions (less than 75% of annual precipitation) occurred in 1988, 2001, and 2002. Precipitation was below normal in 1987-1992, 1994, 1999-2004, and 2006 (Figure 1).

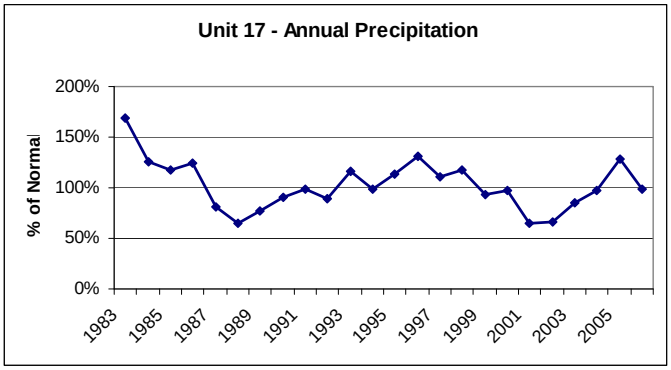


Figure 1. Percent of normal annual precipitation averaged from weather stations in Unit 17 (Utah Climate Summaries 2007).

Seasonal distribution of precipitation (spring vs. fall) may have a larger impact on vegetation trends than total annual precipitation. Analysis of the weather station data showed that spring precipitation was below normal for more than half of the period of record including 1987-1990, 2000-2004, and again in 2007 (Figure 2). Spring precipitation is essential for cool season perennial species to germinate and be productive. Fall precipitation, which benefits cheatgrass (*Bromus tectorum*), was also below normal for more than half of the period of record, and was lowest in 1995 and 1999.

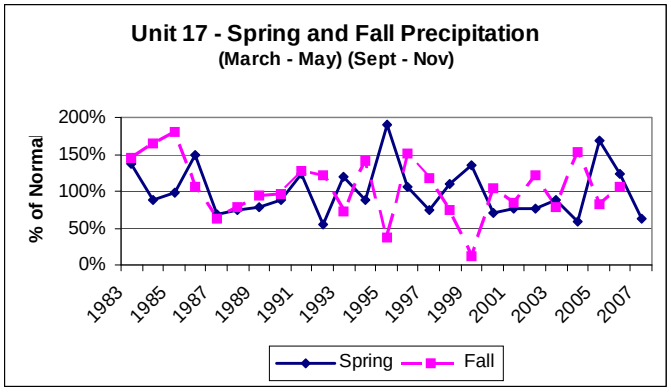


Figure 2. Percent of normal seasonal precipitation averaged from weather stations in Unit 17 (Utah Climate Summaries 2007).

Browse

The cumulative browse trend decreased from 1996 to 2007 (Figure 3). The browse trend was down at 18 studies. Of those 18, 13 were dominated by sagebrush, including Deer Creek Dam (17-5), Wallsburg Turn (17-11), North Wallsburg (17-13), Hoovers Hollow (17-

14), Dutch Canyon (17-17), Coyote Canyon (17-19), Heisetts Hollow (17-24), Long Hollow (17-40), North Bench (17-45), Lower Tank Hollow (17-46), Center Creek (17-60), American Fork Canyon (17-61), and Provo River Canyon (17-68). Trend was down at three of the mountain brush studies: Island Boat Camp (17-15), Tank Hollow (17-42), and Tie Fork East (17-47). Trend was down at one of the sagebrush/oak studies, Lower Big Hollow (17-9), and at the Rocky Mountain smooth Sumac study, Round Peak (17-31).

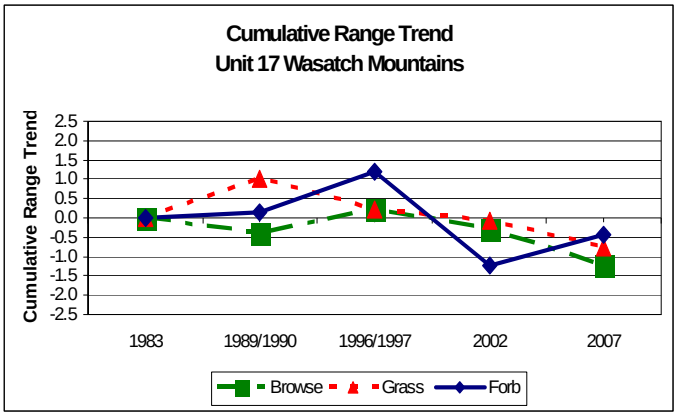


Figure 3. The cumulative range trend for the browse, grass, and forb components from 1983 to 2007 in Unit 17.

The browse trend was slightly down at four studies, two of which were sagebrush dominated: Rainbow Bay (17-16), and Billies Mountain (17-44). Of the remaining two studies, one was dominated by mountain brush, Upper Sheep Creek (17-41), and the other was dominated by cliffrose, Grove Creek (17-62). The browse trend was stable at four studies: North Wallsburg Reseeding (17-12), which is dominated by sagebrush/oak; North Battle Creek (17-25), which is dominated by cliffrose; Orem Water Tank (17-26), which is dominated by oak; and Little Diamond Fork (17-39), which is dominated by sagebrush. The browse trend was slightly up at Water Hollow (17-64), which is dominated by perennial grasses. The browse trend was up at only two studies: Spring Canyon (17-30), a cliffrose community; and Maple Mountain Face (17-34), a sagebrush community.

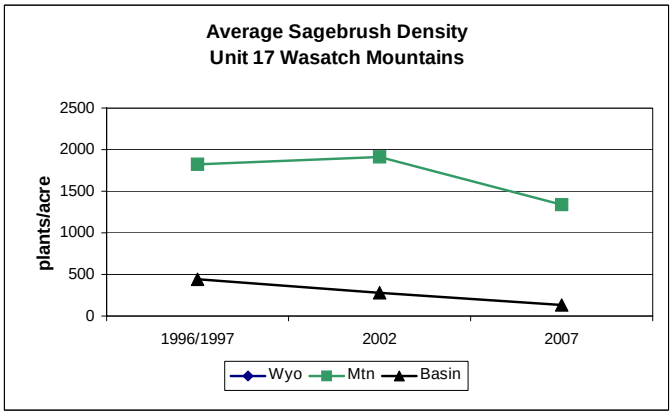


Figure 4. Average sagebrush density of mountain big sagebrush and basin big sagebrush in Unit 17.

The changes in browse trend were largely a product of changes in sagebrush density. The average density of mountain big sagebrush decreased from 1,907 plants/acre (4,720 plants/ha) in 2002 to 1,335 plants/acre (3,304 plants/ha) in 2007, which is a 30% decrease (Figure 4). Basin big sagebrush was sampled at only two studies, and the average density at these studies decreased from 280 plants/acre (693 plants/ha) to 130 plants/acre (322 plants/ha), which is a 54% decrease.

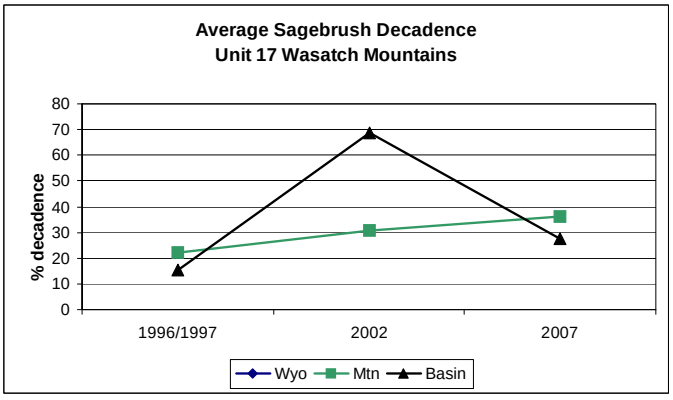
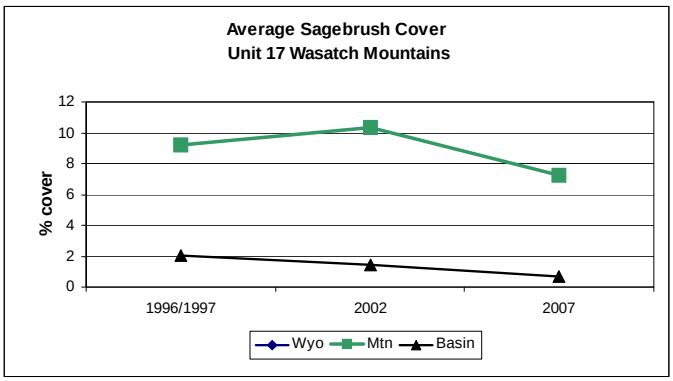


Figure 5. The average percent decadence for mountain big sagebrush and basin big sagebrush in Unit 17.

The unit average percent decadence of mountain big sagebrush increased from 31% of the population in 2002 to 36% in 2007. The majority of the increase in sagebrush decadence occurred in the Heber Valley. The infestation rate of the sagebrush defoliator moth (*Aroga websteri*) in the Heber Valley was also much greater than the rest of the unit. Where present, this moth had infested an average 50% of the plants in the Heber Valley, and 12% in the remainder of Unit 17. It is very likely that the high decadence and high moth infestation rates are related. However, it is difficult to predict the magnitude or duration of the effect that the moth will have on the sagebrush population (Hsiao 1986). The average percent decadence of basin big sagebrush decreased from 69% in 2002 to 28% in

2007. Much of this decrease occurred because the relatively small population of basin big sagebrush at Long Hollow went from 100% decadent in 2002 to 0% in 2007.

The unit average percent cover of mountain big sagebrush decreased from 10% in 2002 to 7% in 2007. Studies where the average cover decreased by more than five percentage points include Deer Creek Dam, Island Boat Camp, Upper Sheep Creek, Center Creek, and Provo River Canyon. At Provo River Canyon, average cover decreased by 14 percentage points. The average cover increased by four percentage points at Maple Mountain Face, the only study to have increased by more than one percentage point.



Fiugre 6. The average percent cover for mountain big sagebrush and basin big sagebrush in Unit 17.

<u>Grass</u>

The unit cumulative grass trend has decreased each sample year since 1989 (Figure 3). The grass trend was down at 10 studies, including Deer Creek Dam, North Wallsburg, Island Boat Camp, Dutch Canyon, Heisetts Hollow, North Battle Creek, Little Diamond Fork, Center Creek, Grove Creek, and Provo River Canyon. The most common reason that the grass trend was down was an increase in cheatgrass abundance. The grass trend was slightly down at six studies, including Lower Big Hollow, Wallsburg Turn, Coyote Canyon, Round Peak, Lower Tank Hollow and Tie Fork East. There were 10 studies with a stable grass trend; North Wallsburg Reseeding, Hoovers Hollow, Rainbow Bay, Orem Water Tank, Spring Canyon, Long Hollow, Upper Sheep Creek, Billies Mountain, North Bench, and Water Hollow. The grass trend was slightly up at American Fork Canyon. At Maple Mountain Face and Tank Hollow, the grass trend was up.

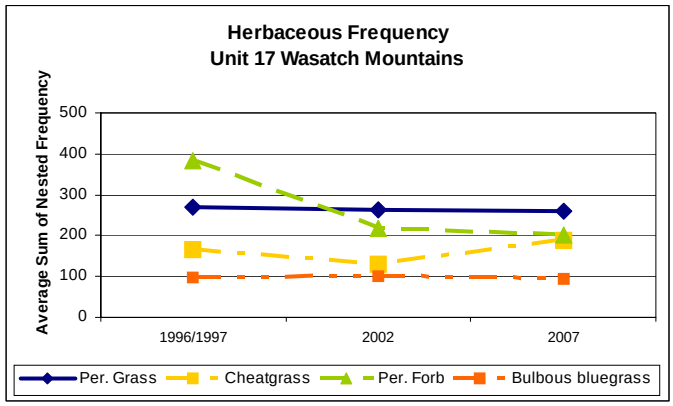


Figure 7. The average sum of nested frequency for the components of the herbaceous understory in Unit 17.

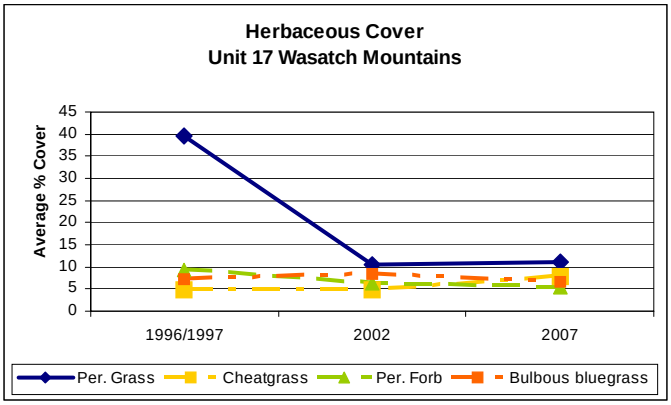


Figure 8. The average percent cover for the components of the herbaceous understory in Unit 17.

The average sum of nested frequency for perennial grasses has changed little since 1997 (Figure 7). Perennial grass cover decreased from an average of 40% in 1997 to approximately 11% in 2002, and remained stable in 2007 (Figure 8). The average nested frequency of cheatgrass decreased from 1997 to 2002, and increased in 2007. Cheatgrass cover was stable at an average 5% in 1997 and 2002, and increased to an average 8% in 2007. Cheatgrass cover decreased at only three studies, and remained stable or increased on the remaining 26 studies. Cheatgrass cover increased by more than seven percentage points at eight studies: Deer Creek Dam, Lower Big Hollow, Coyote Canyon, North Battle Creek, Orem Water Tank, Spring Canyon, Center Creek, and Provo River Canyon. Both the average nested frequency and average cover of bulbous bluegrass (*Poa bulbosa*) increased from 1997 to 2002, and decreased in 2007. This perennial species has a phenology that is similar to annual grasses and may limit the establishment of other species

(Stewart and Hull 1949). There were 11 studies where bulbous bluegrass was sampled in 1997, 20 in 2002, and 21 in 2007. Jointed goatgrass (*Aegilops cylindrica*), a noxious weed, was present at Deer Creek Dam in 2002 and 2007.

Forb

The unit cumulative forb trend increased from 2002 to 2007 (Figure 3). The forb trend was down at nine studies, including Wallsburg Turn, Island Boat Camp, Rainbow Bay, Heisetts Hollow, North Battle Creek, Tank Hollow, Center Creek, Grove Creek, and Provo River Canyon. At five studies, Deer Creek Dam, Dutch Canyon, Orem Water Tank, Little Diamond Fork, and American Fork Canyon, the forb trend was slightly down. The forb trend was stable at five studies, including Lower Big Hollow, North Wallsburg Reseeding, North Wallsburg, Coyote Canyon, and Billies Mountain. The forb trend was slightly up at six studies, including Spring Canyon, Round Peak, Long Hollow, Upper Sheep Creek, North Bench, and Water Hollow. There were four studies: Hoovers Hollow, Maple Mountain Face, Lower Tank Hollow, and Tie Fork East, where the trend was up.

The average sum of nested frequency for perennial forbs decreased 8% from 2002 to 2007 (Figure 7). The average perennial cover decreased from 6% in 2002 to 5% in 2007. (Figure 8). The number of studies with noxious weeds increased from 12 in 1997 to 15 in 2002, and decreased to 11 in 2007. Common noxious forbs have included whitetop (*Cardaria draba*), musk thistle (*Carduus nutans*), field bindweed (*Convolvulus arvensis*), houndstongue (*Cynoglossum officinale*), and dalmatian toadflax (*Linaria dalmatica*). Additionally, leafy spurge (*Euphorbia esula*) was sampled at Dutch Canyon, and yellow starthistle (*Centaurea solstitialis*) was sampled at North Battle Creek and Grove Creek.

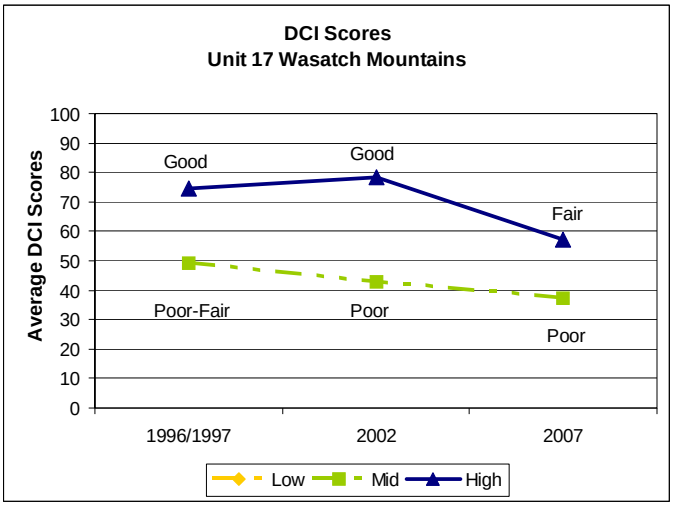


Figure 9. Average DCI scores for Unit 17. The scores are divided into categories based on ecological potential and include: high, mid-level, and low.

Desirable Components Index

The Desirable Components Index (DCI) was calculated for all 29 of the studies that were sampled in 2007. A total of 28 studies are in the mid-level potential category, and one is in the high potential category. For the studies in the mid-level category, the average DCI score decreased from poor-fair in 1997 to poor in 2002, and remained poor in 2007. The DCI continued to be poor because of decreases in browse cover and recruitment, an increase in annual grass cover, and a decrease in perennial forb cover. The DCI score at the high potential study was good in 1997 and 2002, and decreased to fair in 2007. This decrease was the result of a sharp decline in browse cover, and an increase in annual grass cover.